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Jamaica & Dep

Product Brief

Bio-Fuels

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Report Highlights:

Due to Jamaica's preferential access to the US market under the Caribbean Basin Initiative, Jamaica's emerging bio-fuels industry is centered on dehydrating hydrous (wet) ethanol from Brazil for export to the United States. Total dehydration capacity is estimated at about 100 million gallons per year, and is projected to increase to about 270 million gallons over the next three years. Jamaica is expected to commence offering E10 fuel during 2007 to the domestic market creating demand for fuel ethanol of about 99 million liters per year. Local demand is forecasted to increase to 149 million liters over the medium-term.

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Overview: Petroleum Situation

As a non-petroleum producing country, Jamaica fulfills its demand for petroleum products, which account for 88% of energy consumption, from imported crude (18%) and refined (82%) products, mainly from Mexico, Trinidad and Tobago, Venezuela and Ecuador. Despite rising oil prices, domestic petroleum consumption has increased steadily over the last five years to approximately 26 million barrels valued at US\$1.3 billion during 2005. This level of petroleum dependence is partly influenced by the country's access to petroleum supplies under concessionary agreements. Jamaica's burgeoning petroleum consumption is not directly associated with economic expansion or improvement in general living standards. In fact, the increase in Jamaica's energy intensity [from 3.59 barrels of oil equivalent (boe) per US\$1000 of GDP in the 1980's to 5.39 BOE/GDP in 2003] is explained by lackluster GDP growth, inefficient electricity generation, and the energy-intensive nature of the bauxite/alumina and transportation sectors. Additionally, the relative price inelasticity of the Jamaican gasoline (transportation) market discourages fuel conservation and diversification. Consequently, petroleum as a percent of total merchandise imports has increased steeply over the last five years, contributing significantly to a worsening of Jamaica's current account position.

Renewable Energy Policy Environment

a. Policies Supporting Production / Use of Bio-fuels

Against the economic and ecological implications of petroleum dependence, Jamaica has promulgated its recent energy policy (2006-2020), which emphasizes, inter alia, the diversification of its energy supply by increasing the use of available renewable energy sources, namely solar, wind, hydro, and biomass. Further, against the backdrop of unfavorable developments in the European Union's (EU's) reference price for imported sugar from African Caribbean and Pacific (ACP) countries, the policy places special attention on ethanol production from sugarcane feedstock as a means of preserving the Jamaican sugar industry. In this respect, the Government of Jamaica (GoJ) has conducted a pilot study to replace MTBE (Methyl tert-butyl ether) in gasoline with fuel ethanol at an initial rate of 10% (E10), and increase to 15% (E15) over a five-year period. Countrywide availability of E10 fuel is projected to begin during 2007. Concomitantly, the GoJ intends to promote the wider use of flexi-fuel vehicles through a proposed import tax regime, while using an ad-valorem tax initiative to reduce petroleum fuel consumption. The policy also calls for an increase in electricity from renewable sources from the current six percent of annual generation to 10% over the next three years. The major regulatory adjustment to achieve this objective hinges on strengthening operational protocols between the independent power producers and Jamaica Public Service Company, which enjoys monopoly status in the local electricity market. Solar, biogas and hydro are expected to be the main sources of renewable energy consumption in Jamaica over the long-term. Biofuels production is export-concentrated given the low domestic demand, and preferential access to the US market under the Caribbean Basin Initiative (CBI). Recent investments in the Jamaican ethanol industry focus on producing ethanol for export to the United States. Further investments and the development of an efficient ethanol industry in Jamaica are almost exclusively dependent on the preservation of the CBI.

While the energy policy makes provisions for the incorporation of renewable sources in the energy supply mix, it also seeks to preserve existing petroleum accords, and increase the use of liquefied natural gas (LNG) in electricity generation.

b. Size of Motor Vehicle Petroleum-Base Energy Market

Petroleum consumption by sector/industry in Jamaica has shown inappreciable variations over the last five years, with bauxite/alumina processing accounting for 37% of annual consumption, followed by electricity generation (25%) and rail and road transportation (24%). During 2005, the transportation sector consumed an estimated 992 million liters of petroleum fuel. At current consumption levels, the demand for fuel ethanol at 10% (E10) substitution is about 99 million liters, and, excluding the influence of the proposed flexi-vehicle policy, is projected to increase to 149 million liters per year over the medium-term.

c. Bio-fuels Production Capabilities

Currently, there is no fermentation of ethanol in Jamaica. The two existing ethanol plants are equipped with dehydration facilities to convert hydrous ethanol, usually of grades above 70% alcohol per unit volume, to anhydrous at 99.5% alcohol per unit volume. A third plant, which is expected to commence operation by mid-2007, is designed in the first phase to conduct similar dehydration activities. The plants are not configured with fermentation and distillation capabilities, indicating an industry that will, in the short-term, be based on dehydration only. The current ethanol facilities in Jamaica are either joint venture with Brazilian companies or operate under feedstock supply contracts with Brazilian ethanol plants. Production of anhydrous ethanol in Jamaica is mainly a function of the price differentials between the U.S. and Brazil ethanol markets. Dehydration of Brazilian hydrous ethanol in Jamaica for export to the U.S. is economically attractive to Brazilian ethanol producers when the price difference in the U.S. and Brazilian markets is sufficiently large. In this respect, exports of ethanol from Jamaica can be relatively volatile and unreliable.

Jamaica's two existing ethanol dehydration plants have a combined capacity of about 100 million gallons of fuel ethanol per year. The third plant is expected to add an additional 60 to 70 million gallons during 2007. Over the next three years, capacity is forecasted to increase to 270 - 280 million gallons per year, primarily from expansion in the existing facilities. The proposed reform of the sugar industry could increase the number of ethanol facilities and domestic output.

With rising international grain prices and generally inefficient marine transportation systems for imported feed grains, it is strategic for Jamaican feed mills to engage in the production of ethanol from imported grains and or bio-diesel from imported animal fats. To this end, feed mills can derive cost advantage from procuring larger volumes of grains, increasing the size of shipping vessels, and incorporating distillers' grains in feed formulations. Jamaica Broilers Group, the largest integrated feed mill in Jamaica, has diversified into the energy market with the construction of a 60 million gallon ethanol dehydration plant. Fermentation of imported grains is likely linked to any expansion of that facility.

With the reduction in the EU's reference price for imported sugar from ACP countries, the general strategy in the Jamaican sugar industry is to diversify production output, to include the production of ethanol from molasses and possibly sugarcane fiber. In its current state, the Jamaican sugar industry is a high-cost, low-volume, and generally inefficient producer of sugarcane and molasses (See JM6003 for production parameters). Consequently, it is more attractive for private ethanol plants to import lower priced raw materials from Brazil. Recent research on Jamaica's capacity to produce ethanol from sugarcane points to the need for significant increases in productivity and acreage under cultivation. At a minimum, total output of sugarcane in the industry should be increased by approximately 50% to three million metric tons per year to facilitate ethanol production. This target, according to sugar industry analysts, is achievable in the near future with modifications to the current replanting program, and improved irrigation technology and agronomic practices.

The sole ethanol production plant that was established in the sugar industry (Bernard Lodge Sugar Estate) during the 1980's has fallen into disrepair. The major factors in the failure of the plant are cited as unfavorable movement in petroleum prices during that period, and inefficiencies from operating a stand-alone facility. Against this experience, the current model is centered on constructing ethanol plants as components of integrated manufacturing centers, producing raw and refined sugar, molasses, electricity, distilled spirits and fuel ethanol. However, the reform of the Jamaican sugar industry is dependent on the successful divestment of the GoJ's 70% ownership of the industry.

Import Regime

Presently there is no specific government concession extended to ethanol plants as part of a renewable energy strategy. However, since production is solely for export, ethanol facilities are granted free zone status. Consequently, hydrous ethanol is currently exempted from import duties. However, the dynamics in the market should evolve when fermentation of domestic feedstock (molasses) commences. Jamaica is expected to be a high cost producer of ethanol. Given the social and political importance of the sugar industry, government policies are likely to be developed to support the consumption of locally produced ethanol for the domestic transportation sector.

Exports

There is presently no domestic consumption of fuel ethanol in Jamaica. Over the last four years (2002 to 2005) ethanol exports from Jamaica has varied widely between 57 million liters and 125 million liters. The variability is explained by price movements and demand in the US and Brazilian markets. The United States accounts for 100% of Jamaica's ethanol exports.

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